Choptank River

SAV Distribution

The well-defined linkage between water quality and submerged aquatic vegetation (SAV) distribution and abundance make SAV communities good barometers of the health of estuarine ecosystems (Dennison *et al.*, 1993). SAV is important not only as an indicator of water quality, but it is also a critical nursery habitat for many estuarine species. Blue crab post-larvae are 30 times more abundant in SAV beds than adjacent unvegetated areas (Orth, 1992). Similarly, several species of waterfowl are dependant on SAV as food when they over-winter in the Chesapeake region (Perry and Deller, 1995).

SAV distribution is determined through the compilation of aerial photography directed by the Virginia Institute of Marine Science. Reports detailing methodology and annual SAV coverage are available at www.vims.edu/bio/sav. Details on species of SAV discussed in this report can be found at www.dnr.maryland.gov/bay/sav/key.

Habitat Status

The Chesapeake Bay Program has developed new criteria for determining SAV habitat suitability of an area based on water quality. The "Percent Light at Leaf" habitat requirement assesses the amount of available light reaching the leaf surface of SAV after being attenuated in the water column and by epiphytic growth on the leaves themselves (Kemp *et al.,* 2004). The document describing this new model is found on the Chesapeake Bay Program website (www.chesapeakebay.net/pubs/sav/index.html). The older "Habitat Requirements" of five water quality parameters are still used for diagnostic purposes (Dennison *et al.*, 1993).

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SAV has never been reported in the tidal fresh and oligohaline regions (above Bow Knee Point) of the Choptank River (**figure 1**). In 1999 and 2000, experimental transplants of wild celery were performed at Martinak State Park, near Denton. These transplants did not thrive, due to poor water quality and heavy grazing. Very small amounts of SAV have been mapped by the Virginia Institute of Marine Science aerial survey in the area extending from Bow Knee Point to Castle Haven Point (mesohaline region), well below the revised goal (**figure 1**). Ground-truthing by citizen volunteers in the Bow Knee Point and Chancellor Point areas has found horned pondweed, an early season species typically missed by the summer aerial survey. Patterns of SAV distribution match those in the water quality data for these areas. Monitoring station data from Ganey Wharf indicate that only algae levels meet the SAV habitat criteria (**figure 2**), the rest fail. Data from the station at the U.S. Route 50 bridge indicates that levels of total suspended solids and algae pass the habitat requirements. Levels of

nitrogen and phosphorous, percent light at leaf and light attenuation fail in this region.

For the Outer Choptank and Little Choptank Rivers (mesohaline areas), there are very different conditions. The Outer Choptank River has generally shown increasing SAV distribution since 1991 (**figure 1**). However, the data from 1998, 1999 and 2000 indicate that abundance has declined substantially from the peak in 1997, when SAV coverage almost reached the revised goal of 8044 acres. The drop in acreage in 2000 is the most dramatic, probably due to severe algae blooms that impacted much of the Chesapeake Bay mesohaline areas. However, in 2001, SAV rebounded to 5,260 acres (65% of the goal), though 2003 showed another decline to 2,971 acres with a slight recovery in 2004 to 3,772 acres. SAV beds are found fringing much of the shoreline downstream of Chlora and Castle Haven Points. For the Little Choptank River, SAV distribution was highly variable until 1995 (**figure 1**). After that time, SAV coverage dramatically increased to 2,378 acres in 2001 and 2002, or 60% of the goal of 3,950 acres. Acreage has since declined, with 2004 having 1,220 acres of SAV. Most of the beds are found fringing the northern shoreline of the river, while the southern shoreline has fewer beds. Ground-truthing data indicates that the dominant species (in order of the number of occurrence) are widgeon grass, horned pondweed and sago pondweed. Both of these regions have very good water quality, with all parameters passing the SAV habitat requirement in both areas (**figure 2**).

On the Little Choptank River, three eelgrass test sites were installed in November 2004 by MD-DNR staff. These sites were James Island, Ragged Island and near Madison Bay. At each site, three $1m^2$ plots of eelgrass shoots were installed and $4m^2$ of eelgrass seed were broadcast in Fall 2004. Additionally 5 acres of eelgrass seeds were distributed near Susquehanna Neck in Spring 2005. These sites will be monitored monthly and if successful, further large scale restoration work will be considered for 2006.

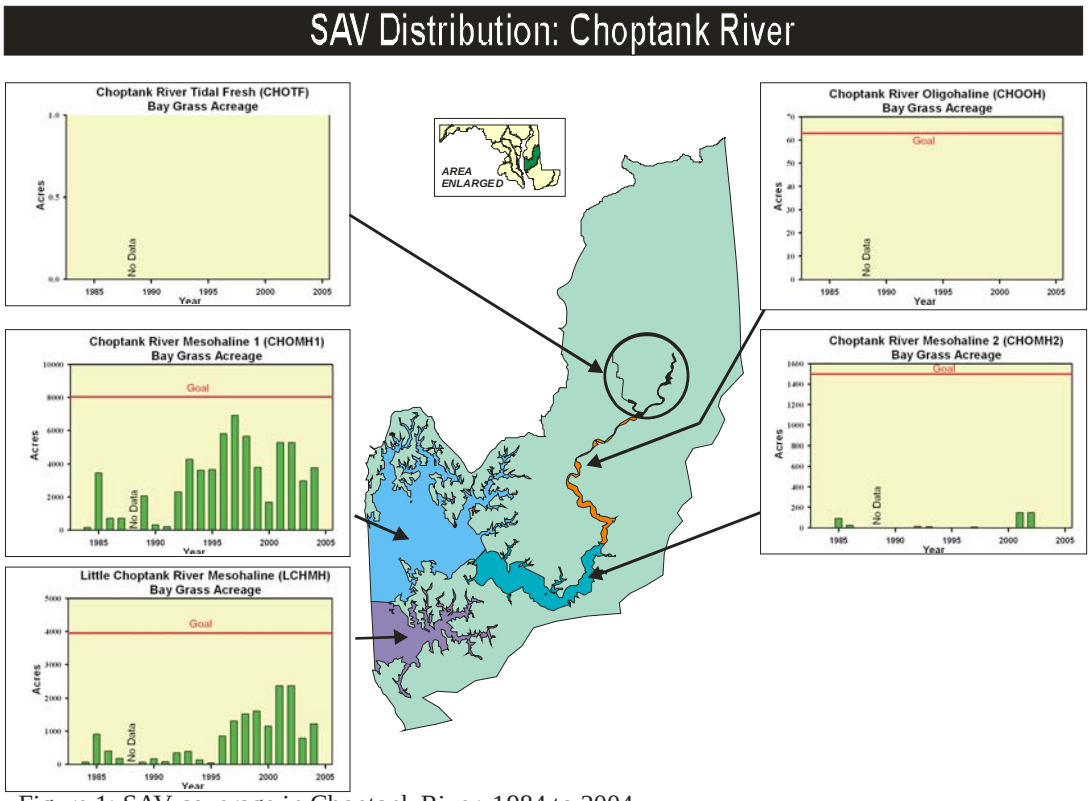

Figure 1: SAV coverage in Choptank River, 1984 to 2004

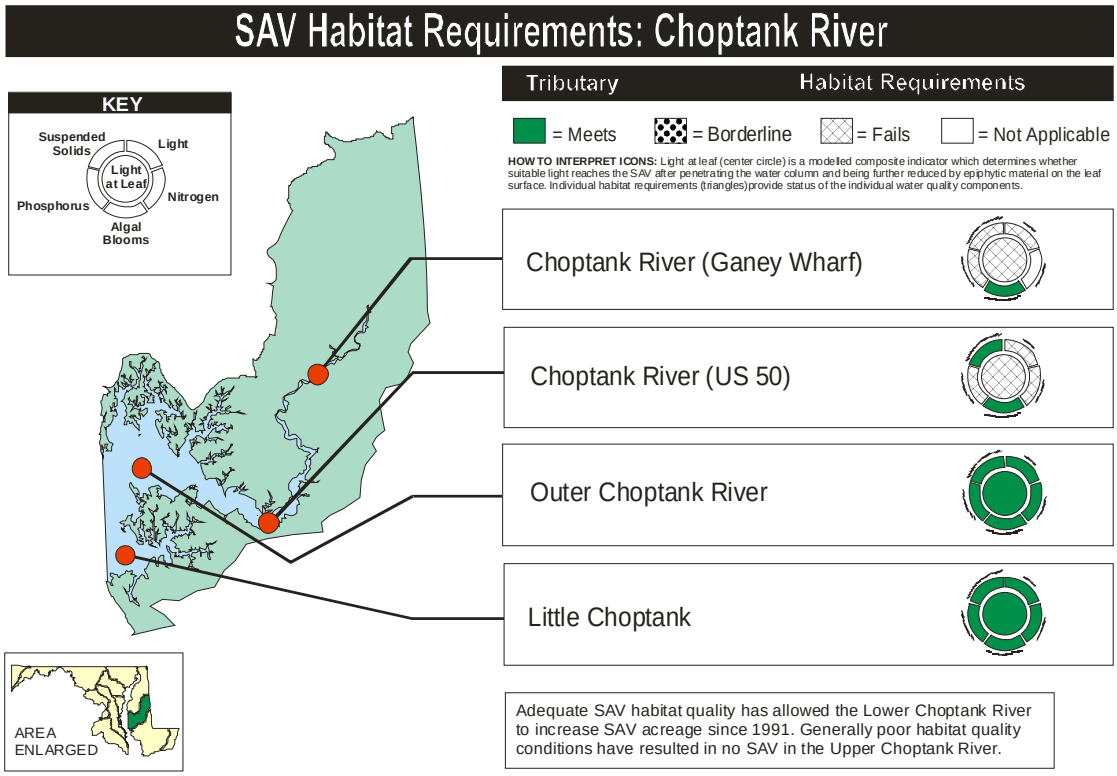

Figure 2: SAV habitat requirement attainment in Choptank River

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